

ledge, and how eagerly they sought his advice upon all doubtful questions in their science. Mr. Nuttall complimented him—by naming for him the genus *Collinsia*—containing some plants of exquisite beauty, and now represented by eleven North American species, mostly Californian, but of which the earliest known was discovered in the valley of the Ohio.

The volume now before us contains an unbroken series of sixty letters from Rev. Henry Muhlenberg, of Lancaster, to whom American botany has been so much indebted, also a correspondence with his son Fred. Aug. Muhlenberg, in which we find the history of the transfer of the Muhlenberg Herbarium to the American Philosophical Society. There are also numerous letters from Stephen Elliott, author of a sketch of the Botany of South Carolina; from Dr. Jacob Bigelow, author of *Florula Bostoniensis*, and still surviving; from Dr. Wm. P. C. Barton, author of the *Compendium Floræ Philadelphicæ*; from Dr. Wm. Baldwin, the talented and lamented young botanist, who died upon Long's Exploring Expedition; from Nuttall, Torrey, Leconte, Sr., and many others well known to the scientific world.

It cannot be expected that these letters of sixty years ago can add any new botanical facts to our stock; but they have great interest as illustrating the early history of botanical science in our land, and as revealing to us the obstacles which the students of that day encountered in the scarcity of books, and in the difficulty of communication.

*Mineralogical Notes; Hydrotitanite, a New Mineral.*—Dr. GEORGE A. KÖNIG communicated the results of an investigation on a changed *garnet* and a changed *perovskite*, from Magnet Cove, Arkansas. A short time ago he had called the attention of the Academy to the occurrence of opaque nuclei observable in microscopic slides of garnets, in which by analysis 6 per cent. of titanic acid was found. He had obtained recently, through the kindness of Dr. Foote, a fragment of a garnet crystal weighing about three ounces, on which the faces of the dodecahedron are visible, and concentrically a nucleus, contrasting by its bright pitchy lustre with the dirty circumferential part of the crystal. The line of contact is apparently very well defined, but on producing on it a fresh fracture, no difference in color and lustre and no line of division can be seen. The streak of the centre is reddish-gray, that of the circumference light greenish-gray. Starting with the hypothesis of a gradual change from inside towards the outside, or, *vice versa*, a cut was made through the crystal, about parallel with one of the principal planes of symmetry, and thus a slice was obtained half an inch thick; this was divided radially into three sections, and one of these was cut into five parts at equal distances from the centre. On reducing the pieces to powder, each by itself, a very gradual change in color was noticeable from the reddish-gray of the central part to the greenish-

gray of the circumference. 0.5 gr. of each sample was fused with 5 grs. of sodium hydro-sulphate, the solution reduced with hydrogen sulphide, after filtration, diluted to 700 c. c. of volume and boiled. Numbering the samples 1, 2, 3, 4, 5 from centre to circumference, the author obtained precipitates by boiling, of respectively 25.00, 16.2, 9.2, 6.0, and 5.0. These precipitates were titanitic acid with normal reactions in numbers 3, 4, and 5; very abnormal in number 1, and less in number 2. The description of the purely chemical investigation into the nature of those abnormal reactions will be reserved for a future memoir.

In order to obtain more light upon the cause of this gradual decrease of titanitic acid from centre to circumference, one of the sectors was ground to a microscopic section, which showed a banded structure at the circumference with a few opaque crystalline fragments imbedded, but besides this the material appeared homogeneous, the color only changing from light-brown, very gradually into black opaqueness. Had the banded structure continued to the core, the explanation might be looked for in the growing of the crystal at intervals in solutions of different composition, but the change being so gradual, the author is inclined to believe in a metamorphic action from the centre. The chemical fact that titanitic acid does not replace one or two of the constituents, as revealed by further investigation, but that silicon, iron, and calcium diminish in the same proportion as titanitic acid increases, speaks in favor of the metamorphosis by intrusion of titanitic acid.

The crystals of perowskite, pure octahedrons, or octahedrons modified by the cube, are often found to have yellowish-gray spots much softer than the rest of the mineral, and, in some instances, the whole crystal is composed of the same yellowish-gray substance. The specific gravity of one of these crystals was found to be 3.681; nearly 0.2 less than the fresh mineral. An analysis of the same made with 0.5 gramme, gave the following:—

TiO <sub>2</sub>	=	82.82
Fe <sub>2</sub> O <sub>3</sub>	=	7.76
MgO	=	2.72
CaO	=	0.80
H <sub>2</sub> O	=	5.50
Vd		Undetermined, but distinct reaction.
		—
		99.60

By metamorphic action nearly all the calcium and some iron have been removed, and water added. The result is a new mineral for which the name *Hydrotitanite* is herewith proposed if the analysis of more specimens should prove the constancy of the composition.